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NEW PLAGIOSTOMIA.

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No. 11. — *New Plagiostomia*. By SAMUEL GARMAN.

THE following are preliminaries of descriptions to be published with more details and with illustrations as soon as the necessary drawings are printed. All except two of the types described are from the collection of Alan Owston, Esq., taken at considerable depths off the Japanese coasts. Excepting one, of the *Platosomia*, all are *Antacea*. It may be added here that the name of this section of the *Plagiostomia* was formed by Rafinesque, 1815, from the Greek "Ἄντα (Latin *ante*), "before, in front," and Ἀκίη or Ἀκίς (Latin *acies*), "a point," for a group comprised of sharks only; it contained no sturgeons, and the name was not, as has been asserted, made from "ἀντακάϊος, sturgeon."

Hemigaleus pectoralis, sp. nov.

Outlines similar to those of the other species of this genus, strongly resembling those of *Mustelus canis* Mitch. Spiracle larger than the pores. Length of the preoral portion of the head greater than the width of the mouth. A moderate labial fold on each jaw. Teeth $\frac{3}{2}$; upper oblique, wide, compressed, with coarse serrations in the notch on the outer side; lower with narrower and more erect cusps, becoming oblique toward the angles of the mouth; three series of smaller erect teeth at the symphysis, both above and below. Intestinal valve with a few transverse turns behind the longitudinal roll.

Grayish brown on the upper surfaces, olive in life, whitish below; fins dark, lighter on hind margins.

No. 847, Mus. Comp. Zool., from the "Aquarial Gardens," for which the collections were made off the coasts of Massachusetts and Rhode Island.

Parmaturus, gen. nov.

Differences in dentition, squamation, and in features of the head and tail, as compared with species of *Catulus* and *Pristiurus*, suggest the advisability of establishing a new genus, *Parmaturus*, to include the species immediately following, and also *Pristiurus eastmanni* J. & S., 1904, from off Izu, Japan, and *Catulus raniurus* Gill., 1891, off Lower California. *Parmaturus* is intermediate between *Pristiurus* and *Catulus*;

it is readily distinguished from the former by the features of the head, and from the latter by the caudal structure.

Parmaturus pilosus, sp. nov.

Head and snout shorter, nostrils closer to the mouth and spines more pilose than on *Pristiurus melastomus* Raf.; in these and other features somewhat nearer to *Catulus*, *Scyllium*. Dorsal fins subequal; origin of first very little backward of that of the ventral, base reaching little farther back than that of the latter; origin of second dorsal above the middle of the base of the anal and end of the base above that of the same fin. Teeth compressed; cusps in variable numbers, upper teeth commonly with six and lower most often with five. Labial folds equal, short, one fourth as long as the jaw. Nostrils wide, close to the mouth, equal in width to the internarial space or twice their distance from the edge of the mouth. Spiracles small, directly behind and distant one diameter from the eye. Gill clefts small, the hindmost two smallest, and situated above the base of the pectoral. Entire length of the pectoral fin hardly half the distance between its base and that of the ventral. Scales minute, velvety, each with a long, strong median cusp at each side of the base of which is a rudiment.

Uniform brown on back and fins, latter with black margins; light below, the lighter color extending up behind and above the pectoral fins.

No. 1107, Mus. Comp. Zoöl.

Hab. Lat. 34° 59' N.; Lon. 139° 31' E. "430 fathoms. Golden Hind."

Centrophorus, M. & H., 1837.

Present knowledge will hardly sanction acceptance of this genus as constituted by Günther, 1870. The species appear to group themselves in four distinct genera: (1) *Centrophorus* M. & H., 1837, of which *Squalus granulatus* Bl. & Sch., 1801, is the type, (2) *Acanthidium* Lowe, 1839, with the type species *A. calceus* Lowe, 1839, *Deania* J. & S., 1902, being a synonym, (3) *Seymnodon* B. & C., 1864, as represented by *S. ringens* B. & C., 1864, and (4) *Centroscymnus* B. & C., 1864, typified by *C. coelolepis* B. & C., 1864, and including the species of *Zameus* J. & F., 1903. Besides the new species added to these genera it is found that the affinities of *Squalus uyato* Raf., 1810 (*Spinax uyatus* Bonap., *Acanthias uyatus* M. & H.), are such as to remove it from the genus *Acanthias*, *Squalus* of later authors, and place it among the species of *Centrophorus*. All of these, with some differences of inclusion, are genera established before the publication of Günther's arrangement.

Centrophorus acus, sp. nov.

In general the outlines, dentition, and squamation resemble those of *C. granulatus* Bl. & Sch. Dorsal spines projecting beyond the skin. Teeth $\frac{3}{3}$, upper the more erect and narrower, lower with the cutting edge directed obliquely toward the

angle of the mouth; no median tooth in the lower jaw. Labial folds short, almost hidden in the groove. Distance between the inner edges of the nasal valves less than one third of the preoral length of the snout. First dorsal entirely in the forward half of the total length. Hinder angles of pectorals and ventrals slightly produced, longer on dorsals. Length of base of second dorsal less than three fourths of that of the first, not including the spine, contained three and two thirds times in the distance between the two spines. Ends of ventrals reaching backward of the spine of the second dorsal. Scales small, with stout stalks, and with several keels on the crown, the median one of which ends in a sharp cusp; lateral cusps rudimentary; keels less sharp toward the apex of the scale on the flanks.

Brown, nearly uniform, sprinkled with white single scales.

Distinguished from *C. tessellatus* by larger dorsals, less production of hind angles of dorsals, pectorals and ventrals, smaller sharper scales, smaller eyes, by dentition, and by a darker more uniform coloration.

No. 1049, Mus. Comp. Zool. of a total length of $32\frac{1}{4}$ inches.

Hab. Japan.

Centrophorus tessellatus, sp. nov.

Closely allied to *C. granulatus*, spines and scales similar. Teeth $\frac{42}{31}$, compressed, serrated on the basal portions of the cutting edges; upper with slender, sharp pointed cusps, more numerous and more erect, becoming more oblique toward the angles of the mouth; lower with oblique laterally directed cusp situated between two notches at the outer end of a serrated and arched portion of the cutting edge; a median tooth on the symphysis below; several series in function in the upper, and two in the lower. Labial folds extending less than half-way from angle to symphysis. Internarial distance equal to more than half the distance from the mouth. Spiracle large, superior, distant from the eye one and one half times the spiracular diameter, up and backward. Posterior angles of dorsals, pectorals, and ventrals much produced; length of base of first dorsal two fifths of the distance from the second, base of second three fourths of that of the first, end of pectoral reaching beyond the first dorsal spine; origin of first dorsal little backward of the axil of the pectoral; spine of second dorsal one third exposed; lower lobe of caudal well developed, end of caudal deep.

Light brownish on back and flanks, white below, a white band at margins of fins and gill clefts. Total length $34\frac{1}{2}$ inches.

No. 1031, Mus. Comp. Zool.

Hab. Lat. 35° N.; Lon. $139^{\circ} 30'$ E. 400 fathoms.

The shagreen of this shark, from specimens of moderate size, is no doubt as well adapted for covering the grip in the handles of sabres, swords, and other cutlery as that of *Centrophorus granulatus*.

Acanthidium LOWE, 1839.

Deania J. & S. 1902.

In the collection there are representatives of three species, neither of which is to be identified with the previously described species, *A. eglantina* of Japanese waters and *A. calceus* from the seas of Europe. They are

distinguished by differences in rostral lengths, in the teeth, in the shapes, positions, and lengths of the fins, in the scales, colors, etc. Generically they agree in the characters of the head, the greatly produced snout, large eyes, in nostrils, teeth, and spiracles, in the characters of the fins, and in general shapes. In the scales they are farther than *A. calceus* from *Centrophorus*, though like that species, their scales have slender peduncles and are erect, but each has three slender, distinct, and sharp cusps, without the web-shaped connections between their bases. On the inside of the valves the spiracles are provided with ridges like the gill laminae; in front of the valve there is a blind cavity or chamber, extending forward, like that of *Centroscyrnus*, but of much less extent, or that of *Centrophorus*. The inner angles of dorsals and ventrals are much produced; those of the pectorals are short.

Acanthidium rostratum, sp. nov.

Rather more compressed in body than the other species of this genus. Dorsal spines strong, moderately exposed. Base of first dorsal in the forward half of the total length; inner angles of dorsals greatly, and those of the ventrals moderately produced; inner angle of pectoral little longer than outer, not produced in a point; base of first dorsal about two fifths of its distance from that of the second, base of second dorsal little more than that of the first; end of base of ventral nearly reaching a vertical from the second dorsal spine. Teeth $\frac{36}{30}$; upper with a notch at each side of the cusp, which latter is oblique and becomes more so toward the angles of the mouth; lower with cutting edges very oblique, approaching a horizontal. Upper labial folds hidden in the deep oblique grooves, half or more of each of which is in front of the angle; lower folds long, more than half as long as the jaw. Spiracle large, above the level of the eye and one diameter farther back; valves with small ridges; prevalvular chamber of moderate extent. Scales minute, with erect slender peduncles, and slender spine-like cusps, each of which is surmounted by a sharp longitudinal keel.

Light brownish or grayish brown, greenish or olive in life; lighter beneath; little darker on back, top of head or tail; whitish on hind and inner margins of dorsals, pectorals, and ventrals.

Total length, 34 inches.

No. 1047, Mus. Comp. Zoöl.

Hab. Suruga Gulf, Japan.

Acanthidium hystricosum, sp. nov.

Head nearly one fourth, tail one third, and caudal fin two ninths of the total length. Middle of the total length in the middle of the base of the first dorsal, including the spine. Teeth $\frac{33}{30}$, compressed; upper with narrow triangular cusps, which are triangular also in cross section, erect near the symphysis, little oblique toward the angles of the mouth; lower with cusps directed toward the corners of the mouth so much that each cutting edge is almost parallel with the edge of the jaw;

no median tooth below. Labial folds extending half the length, or a little more, of each jaw. Internarial distance two thirds of the distance from the end of the snout. Hinder angles of dorsals and ventrals much produced; pectorals subtruncate, with rounded angles, reaching half-way to a vertical from the first dorsal spine; base of second dorsal four fifths of that of the first dorsal, more than the total length of the ventral, fin reaching the caudal; end of ventral extending below more than half the base of the second dorsal. Spiracle large, distant one diameter from the orbit, above and slightly backward. Width of first gill cleft half the orbital length, hindmost clefts little wider and little nearer one another. Scales much larger than those of *A. rostratum*, pedunculate on a radiating base, with three slender cusps, harsh to the touch. Total length, $36\frac{1}{2}$ inches.

Dark brown, somewhat lighter below, black in the mouth, nostrils, orbits, gill clefts, spiracles, and on the edges of the fins.

No. 1130, Mus. Comp. Zoöl.

Hab. Sagami Bay, Japan.

Acanthidium aciculatum, sp. nov.

Elongate, slender, moderately compressed, caudal fin about one fifth of the total length. Teeth $\frac{3}{3}$, intermediate between those of the preceding and those of *Scymnodon ringens* B. & C., both upper and lower with more or less erect sharp pointed cusps, those on the upper jaw triangular and those on the lower bearing the cusp on the outer portion of the cutting edge. A few of those on the lower symphysis are nearly erect, the others become more and more oblique toward the angles. Internarial distance nearly one fourth as long as the snout. Spiracles large, near the eye, valves with ridges resembling the laminae of the gills. Dorsal spines large, strongly curved, that of the second dorsal much exposed; inner angle of pectoral rounded, not produced; length of the base of the second dorsal five sixths of that of the first, and the length of the base of the latter is three fifths of the distance between the bases of the two fins, or three eighths of the distance between the two spines. Scales very small, similar to those of *A. calceus*, but apparently having cusps more slender, sharper, and more erect; median cusp directed backward, lateral cusps extended out more toward the sides. Caudal fin deep, lower lobe not greatly developed. Total length, $34\frac{1}{2}$ inches. Uniform dark brown.

No. 1128, Mus. Comp. Zoöl.

Hab. Sagami Bay, Japan.

Centroscymnus Owstonii, sp. nov.

This species bears some likeness in form to *C. coelolepis*; it is distinguished by a snout that is longer, broader, and less pointed at the end, by nostrils that are farther apart, by a narrower mouth, by teeth on the lower jaw that are less nearly parallel with the edges of the mouth, by scales that are smaller and more keeled, and by fins of which the extremities of the dorsals are less pointed and the hinder ends of the bases of the ventrals are farther forward as compared with those of the second dorsal.

Dorsal spines hardly projecting beyond the skin. Scales pedunculate, pluricarinata on head, shoulders, and belly. Teeth $\frac{72}{0}$; upper lanceolate, more than twice as numerous as lower, in two groups at each side, cusps shaped like a spear-head, subtriangular in transection, several rows in function; lower broad, compressed, cusps with a deep notch at the outer edge, apex raised, cutting edge rising obliquely toward the angles of the mouth, one row in function; no median tooth at the lower symphysis. Labial folds hidden in the deep, straight, oblique folds crossing the angles of the mouth; lower short, upper much longer and reaching half-way to the middle of the mouth, that is, a little farther than the groove. Nostrils widely separated, nearer to end of snout than to mouth. Spiracles medium, superior, one diameter backward and two diameters distant from the orbit, with a large antespinal chamber, extending forward from the valve to a point above the posterior angle of the orbit, valve with folds on its inner side like gill lamellae. The lining of the prespiracular chamber is without shagreen and apparently is sensitive. Posterior margin of pectoral oblique, inner angle much shorter; base of second dorsal longer and fin higher than in first dorsal, hinder angle produced, base equal one fifth of its distance from the first dorsal base; end of pectoral not reaching to a vertical from the first dorsal spine; end of ventral base reaching a vertical from the spine of the second dorsal.

Uniform dark brown.

No. 1037, Mus. Comp. Zoöl. Total length, $31\frac{1}{4}$ inches.

Hab. Yenoura, Suruga Gulf, and Sagami Bay, Japan.

Named in honor of Alan Owston, Esq.

Pristis clavata, sp. nov.

The group of species of this genus containing *P. pectinatus* Lath., 1794, and *P. zysron* Btkr., 1852, is that in which the present form most naturally falls.

Rostral teeth in twenty-one pairs, not trenchant behind. Origin of the first dorsal one fourth of the length of its base farther backward than the origin of the ventral. Pectoral origin in advance of the first gill cleft nearly the width of the internarial space, or the length of the orbit; outer angle of pectoral fin blunt and bluntly rounded. Second dorsal smaller than first dorsal, length equal about three fifths of the length of the caudal fin, or one sixth shorter than first dorsal. Caudal fin obliquely truncated without an anterior lobe on the subcaudal portion. Total length, $24\frac{3}{8}$ inches.

No. 733, Mus. Comp. Zoöl.

Hab. "Queensland, Australia."

Distinguished from *Pristis pectinatus* by the smaller number of rostral teeth and the position of the first dorsal backward of the origins of the ventrals; from *P. zysron* by the smaller number of teeth in the saw, the more forward origin of the first dorsal, and the second dorsal smaller than the first dorsal; and from *P. zephyreus* J. & S., 1895, by the backward origin of the first dorsal, the lobeless caudal fin, and the spacing of the rostral teeth.